Pollinators

Pollination and conservation: It begins with you
Pollinators play a critical role in maintaining healthy ecosystems. Bees, birds, bats, and other pollinators are key players in crop production, maintaining diverse, productive plant communities, and providing food that sustains both people and wildlife.

What is pollination?
Pollination is the transfer of pollen from one flowering plant to another. While some pollen is transferred by the wind, the majority of the world’s flowering plants depend on animal pollinators to reproduce.

Plants and pollinators exist in a mutualistic relationship, in which each one depends on the other for its survival. Plants provide a food source for pollinators, particularly nectar and pollen. When the pollinators visit in search of food, pollen collects on their mouths, beaks, antennae, wings, and/or abdomen (depending on the pollinator species), and then the pollen rubs off when the animal visits a subsequent plant. The deposited pollen is critical for plant reproduction, allowing fertilization and the formation of fruits or seeds.
Iowa’s native bees

Did you know? Iowa has over 200 species of native bees today! When Iowa’s landscape was covered in tallgrass prairie, our state was home to over 400 species of native bees. While honey bees are not native—they were brought over from Europe to help pollinate crops—the hundreds of native bee species that we do have today also play a critical role in pollination.

Who are the key pollinators?

Pollinators come in a variety of shapes and sizes, and carry out pollination through a variety of means. In the Midwestern U.S., common pollinators include bees, wasps, butterflies, moths, birds, bats, and more. Bees are the most important and abundant of all animal pollinators, and are the primary focus of this fact sheet.

Habitat for pollinators

Different nectar and pollen sources are needed for different bees throughout the growing season. Likewise, plants rely on certain bees to visit them at certain times when they are in bloom—otherwise pollination will not happen. Thus, maintaining a vibrant diversity of plants and animal pollinators is of key importance!

Providing abundant wildflower habitat is critical for maintaining pollinator populations. Native wildflowers, shrubs, and trees provide shelter and food for a diversity of wildlife forms, including pollinators. Minimizing ground disturbance is important, also, as 80 percent of Iowa’s native bees are ground nesters. They burrow and build solitary nesting tunnels underground.

Risks to pollinators

Pollinators, particularly bees, have been in the news recently for all the wrong reasons—pollinator populations are declining rapidly due to a variety of challenges in their surrounding environment. According to the USDA, from 2006-2014, nearly a third of all bees nationwide died annually. Many pollinators are at risk due to such environmental stressors as habitat loss/fragmentation, weather extremes, disease, parasites, and insecticides.

Habitat loss poses a major threat to pollinators. In the state of Iowa, for instance, our landscape was 85 percent native prairie in the year 1850. As native vegetation is replaced by roadways, lawns, golf courses, and crop fields, pollinators lose the food and nesting sites that are necessary for their survival.

Weather extremes can have detrimental effects on pollinator populations. For instance, experts estimate that 65-70 percent of Iowa’s honeybees didn’t survive the harsh winter of 2013-2014.

Disease and parasites also weaken the resilience of bee populations. Of particular concern is the varroa mite, a parasite that can weaken bees’ immune systems and infect them with viruses.

Along with the rise in use of Roundup-Ready and other genetically modified crops, one particular type of insecticide, neonicotinoids, has risen in use to become the number one insecticide used in the world. Neonicotinoids are frequently used as a seed treatment, including for corn and soybean seeds. However, when these crops are being planted, dust vented from planters can include a large amount of residue from the neonicotinoid seed coating, which has been shown to contaminate surrounding flowers. Pollen from these flowers can be contaminated with high levels of neonicotinoids and such pollen can then be picked up by bees for feeding. This insecticide has been shown to cause problems with orientation, impaired memory, and learning that reduce bees’ ability to gather food. Neonicotinoids have also been found to negatively affect song bird populations as well as contaminating soil and water resources.
Pollination and agricultural conservation—an integrated approach

Pollinator conservation and agricultural production can happen on the same lands—an integrated approach is key. Integrating small areas of native vegetation into your farming operation can offer disproportionate benefits.

Pollinators, especially bees, provide a large economic value. They provide free pollination services while benefitting farm productivity and profitability through increased yields and improvements in crop quality\(^1\). Furthermore, areas of restored prairie, riparian buffers/grass filter strips, hedgerows, and windbreaks offer a multitude of additional environmental benefits, including improved water quality, erosion control, and habitat for song birds, game birds, pollinators, and insects, including crop pest enemies.

The USDA–Natural Resources Conservation Service offers several recommendations for ensuring healthy pollinator populations, and in turn, healthy crops, on your farm:

- Minimize tillage. Many of our best crop pollinators, including 80 percent of native bees, live underground for most of the year, often at the base of the very plants they pollinate. Minimize tillage to maximize habitat and pollination benefits.
- Protect from pesticides. Most insecticides are toxic to bees, and excess herbicide use can harm many of the flowers that they need for food. Be cognizant of pesticide rates and timing of application, and choose ingredients targeted to specific species. Spray on calm, dry evenings, soon after dark when bees are not active. Even when crops are not in bloom, pollinators may be visiting nearby flowers, where they can be affected by pesticides.
- Maximize plant diversity. Bees rely on an abundance and variety of flowers throughout the growing season. Native plant species are particularly valuable. In order to increase the number of native bees pollinating your crops, plant hedgerows or windbreaks with a variety of flowering plants and shrubs. Or consider adding native prairie filter strips into your row-crop farming operation; the benefits to soil erosion, nutrient transport, and biodiversity are amazing!

Financial and/or technical assistance may be available through the Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), U.S. Fish & Wildlife Partners Program, and Trees Forever.

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\(^1\)Xerces Society for Invertebrate Conservation

A world without pollinators?

In the Sichuan province of China, pollination is now being carried out by humans. With bees and other pollinators gone, human workers carry out pollination by hand, using bottles of pollen and pollination brushes, manually transferring pollen to millions of pear and apple tree blossoms each spring.
Backyard Conservation

Native vegetation, along with a variety and abundance of flowering plants, provides critical habitat and food source for pollinators such as bees. The USDA-Natural Resources Conservation Service provides the following suggestions for maximizing backyard habitat for pollinators:

- Use pollinator-friendly plants in your landscape. Shrubs and trees such as dogwood, blueberry, cherry, plum, willow, and poplar provide pollen and/or nectar early in spring when food is scarce.
- Choose a mixture of plants for spring, summer, and fall. Different flower colors, shapes, and scents will attract a wide variety of pollinators. Even window boxes and small container gardens on patios and balconies help.
- Reduce or eliminate pesticide use in your landscape, or incorporate plants that attract beneficial insects for pest control. Use pesticides sparingly and responsibly.
- Accept some plant damage on plants meant to provide habitat for butterfly and moth larvae.
- Provide clean water for pollinators with a shallow dish, bowl, or birdbath with half-submerged stones for perches.
- Leave dead tree trunks in your landscape for wood-nesting bees and beetles.
- Support land conservation in your community by helping with community gardens and green spaces to ensure that pollinators have appropriate habitat.

Golf courses can provide critical habitat for pollinators, as well, by maintaining designated undisturbed wildflower habitats through programs such as Operation Pollinator. Such plantings also offer the added benefit of increased aesthetic beauty on the course grounds.

Resources

The Xerces Society for Invertebrate Conservation, [www.xerces.org](http://www.xerces.org);
- “Attracting Native Pollinators: Protecting North America’s Bees and Butterflies”
- “Farming with Pollinators”
- “Midwest Pollinator Plant List”

Leopold Center for Sustainable Agriculture: “Incorporating Prairies into Multifunctional Landscapes” [www.leopold.iastate.edu](http://www.leopold.iastate.edu)

Pollinator Partnership website: [www.pollinator.org](http://www.pollinator.org)

Operation Pollinator website: [www.operationpollinator.com](http://www.operationpollinator.com)


Science-Based Trials of Row Crops Integrated with Prairie Strips website: [www.nrem.iastate.edu/research/STRIPS](http://www.nrem.iastate.edu/research/STRIPS)


U.S. Fish & Wildlife Service Pollinators webpage: [www.fws.gov](http://www.fws.gov)

For more information

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Iowa Learning Farms is funded by the Iowa Department of Agriculture and Land Stewardship through the Integrated Farm and Livestock Demonstration Program, in collaboration with Iowa Department of Natural Resources (United States Environmental Protection Agency), Natural Resources Conservation Service, Conservation Districts of Iowa, Iowa State University Extension and Outreach, Leopold Center for Sustainable Agriculture, Iowa Farm Bureau Federation and Iowa Water Center. This cooperative project has been funded in part through Section 319 of the Clean Water Act.